

REMARKS

Reconsideration and allowance of the present application based on the following remarks are respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 7, 9-13, and 15-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fonash et al. (US 2003/004017 A1) in view of Lavallee et al. (US 2003/180627 A1) and/or further in view of Tao et al. (US Patent No. 5,497,000), Chiba et al. (US 2002/0134426 A1), Milanovski et al. (US Patent No. 6,770,190), or Applicants' Admitted Prior Art (Applied Physics Letters, Vol. 82-10, "AAPA"). Applicants respectfully traverse this rejection for the following reasons.

Independent claims 7, 9, and 12 recite the steps of: ... e) forming an upper electrode ... so that an upper electrode is formed on the sacrificial layer surrounding the lower electrode ..., wherein ... the nano gap is formed so that vertical and horizontal distances thereof are asymmetric so that the horizontal distance is larger than the vertical distance. That is, the upper electrode is formed to surround the lower electrode and "the vertical distance" means the distance between the lower electrode (43) and the upper electrode (45) in a vertical direction and "the horizontal distance" means the distance between the lower electrode (43) and the upper electrode (45) in a horizontal direction (Applicants' disclosure, page 8, lines 7-14; and Figs. 1E-1F). In this context, "asymmetric" means that the horizontal distance is larger than the vertical distance (Applicants' disclosure, page 8, lines 14-16; and Figs. 1E-1F). Nowhere do Fonash et al., Lavallee et al., Tao et al., Chiba et al., Milanovski et al., or AAPA disclose, teach or suggest these claimed features.

In Fonash et al. which is the primary reference cited by the Examiner, the upper electrode 33 is not formed to surround the lower electrode 30 (Fonash et al., Figs. 3a to 3C). Therefore, the nano gap in Fonash et al. has *neither* a horizontal distance between the upper and lower

electrodes *nor* asymmetric horizontal and vertical distances. It is submitted, therefore, that Fonash et al. fail to disclose, teach or suggest the claimed features of forming the upper electrode surrounding the lower electrode and forming a nano gap having asymmetric vertical and horizontal distances.

Lavallee et al., Tao et al., Chiba et al., Milanovski et al., or AAPA do not disclose upper and lower electrodes and a sacrificial layer, let alone asymmetric horizontal and vertical distances. Therefore, the secondary references cited by the Examiner fail to disclose, teach or suggest the above claimed features, too.

Therefore, Applicants respectfully submit that claims 7, 9, and 12 are not obvious over the combination of Fonash et al. in view of Lavallee et al. and respectfully request withdrawal of the rejection of claims 7, 9, and 12 under 35 U.S.C. § 103(a). Claims 10-11, 13, and 15-17 are believed allowable for at least the reasons presented above with respect to claims 7, 9 and 12, by virtue of their dependence from claims 7, 9, and 12, respectively.

The Examiner noted that “Fonash et al. show (e.g., Fig. 3) a smaller upper electrode and a larger lower electrode which comprise an asymmetric nano gap between the upper and lower electrodes” (Final Office Action, page 3, lines 2-4; and Response to Arguments at page 5, 2nd paragraph). Applicants respectfully disagree with the Examiner because a small upper electrode and a larger lower electrode do not comprise “asymmetric” as recited in claim 7. Again, “asymmetric” means a larger horizontal distance between the lower electrode and the upper electrode that is formed surrounding the lower electrode, and it does not mean a smaller upper electrode and a larger lower electrode, or vice versa.

In response to Applicants’ arguments against Lavallee et al., Tao et al., Chiba et al. and Milanovski et al., the Examiner noted that “one can not show nonobviousness by attacking references individually where the rejections are based on combinations of references.” Applicants had discussed the teachings of the cited references in order to show that they failed to teach or suggest all the claim limitations of the claimed invention. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the

prior art. MPEP § 2143.03; *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003). It is believed that Fonash et al. do not show the claimed feature of forming the upper electrode surrounding the lower electrode and forming a nano gap having asymmetric vertical and horizontal distances. In order to establish a prima facie obviousness case of claim 1 by combining another prior art reference with Fonash et al., such prior art reference must disclose, teach or suggest forming the upper electrode surrounding the lower electrode and forming a nano gap having asymmetric vertical and horizontal distances. However, none of Lavallee et al., Tao et al., Chiba et al. and Milanovski et al. disclose, teach or suggest this feature.

With regard to rejection of claims 15-17 under 35 U.S.C. § 103(a) as being unpatentable over Fonash et al. in view of Lavallee et al. and further in view of AAPA, the Examiner noted that “AAPA comprises a sacrificial platinum layer” (Final Office Action, page 4, 4th paragraph to page 5, 2nd paragraph). Applicants respectfully disagree with the Examiner because AAPA uses platinum as Ti/Pt nonowire electrode, not as a sacrificial layer as in the claimed invention (AAPA, page 1610, right column, lines 16-20; page 1611, left column, lines 1-2 and right column, lines 1-5 and 29-33). Therefore, claims 15-17 are believed allowable on their own merits as well as for the reasons presented above with respect to claims 7, 9 and 12, by virtue of their dependence from claims 7, 9, and 12, respectively.

Conclusion

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and a notice to that effect is earnestly solicited. Should any questions remain unresolved, the Examiner is encouraged to contact the undersigned attorney for Applicants at the telephone number indicated below in order to expeditiously resolve any remaining issues.

Respectfully submitted,
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